

MULTIPURPOSE ROTATING MACHINE FOR IMMOBILIZATION
AND CONDUCTING STUDIES ON SMALL LABORATORY ANIMALS

N. F. Kornelishin

Translation of "Mnogotselevoy vrashchayushchiysya stanok dlya immobilizatsii i provedeniya issledovaniy na melkikh laboratornykh zhivotnykh", Patologicheskaya Fiziologiya i Eksperimental'naya Terapiya, No. 5, Sep-Oct 1979, pp 80-82

(NASA-TM-76049) MULTIPURPOSE ROTATING
MACHINE FOR IMMOBILIZATION AND CONDUCTING
STUDIES ON SMALL LABORATORY ANIMALS

N80-18682

(National Aeronautics and Space
Administration) 7 p HC A02/MF A01 CSCL 14B G5/51 47202 Unclassified

REPRODUCTION RESTRICTIONS OVERRIDDEN

NASA Scientific and Technical Information Facility



NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
WASHINGTON, D. C. 20546 FEBRUARY 1980

STANDARD TITLE PAGE

1. Report No. NASA TM-76049	2. Government Accession No.	3. Recipient's Catalog No.	
4. Title and Subtitle Multipurpose Rotating Machine for Immobilization and Conducting Studies on Small Laboratory Animals		5. Report Date February 1980	
7. Author(s) N. F. Kornelishin		6. Performing Organization Code	
		8. Performing Organization Report No.	
		10. Work Unit No.	
9. Performing Organization Name and Address SCITRAN Box: 5456 Santa Barbara, CA 93108		11. Contract or Grant No. NASw- 3198	
12. Sponsoring Agency Name and Address National Aeronautics and Space Administration Washington, D.C. 20546		13. Type of Report and Period Covered Translation	
15. Supplementary Notes Translation of "Mnogotselevoy vrashchayushchiysya stanok dlya immobilizatsii i provedeniya issledovaniy na melkikh laboratornykh zhivotnykh", Patologicheskaya Fiziologiya i Eksperimental'naya Terapiya, No. 5, Sep-Oct 1979, pp 80-82		14. Sponsoring Agency Code	
16. Abstract The article describes a new device, which has advantages over extant machines, for the purpose of assisting the researcher in conducting laboratory experiments on small animals.			
17. Key Words (Selected by Author(s))		18. Distribution Statement This copyrighted Soviet work is reproduced and sold by NTIS under license from VAAP, the Soviet copyright agency. No further copying is permitted without permission from VAAP.	
19. Security Classif. (of this report) Unclassified	20. Security Classif. (of this page) Unclassified	21. No. of Pages 6	22. Price

UDC 612-082.5

MULTIPURPOSE ROTATING MACHINE FOR IMMOBILIZATION AND CONDUCTING STUDIES ON
SMALL LABORATORY ANIMALS

By N. F. Kornelishin, Department of Physiology, 'Ternopol' Medical Institute

In order to conduct experimental studies and manipulations on small /80* laboratory animals (rats, mice, guinea pigs and others) it is necessary, as a rule, to immobilize them with the preservation here if possible of free access of different surfaces, parts of their body and organs. The extant devices for this purpose [1-7] as a rule permit experiments primarily only of some definite profile and are not always suitable for conducting another type of experiment, especially if it is necessary to change the position of the fixed animal many times in the process of work.

This machine is a device for fixing animals and subsequent conducting on them of experimental studies. As compared to the known it has a number of advantages: 1) it permits a considerable increase in the surface of the

*Numbers in margin indicate pagination in original foreign text

body of the fixed animal that is accessible (open) for the researcher, 2) it guarantees the possibility of conveniently changing during the experiment position of the animal by rotating it around a longitudinal horizontal axis of fixation, and 3) it contains certain devices to carry out different effects on the experimental object and record the functional indices.

/8:

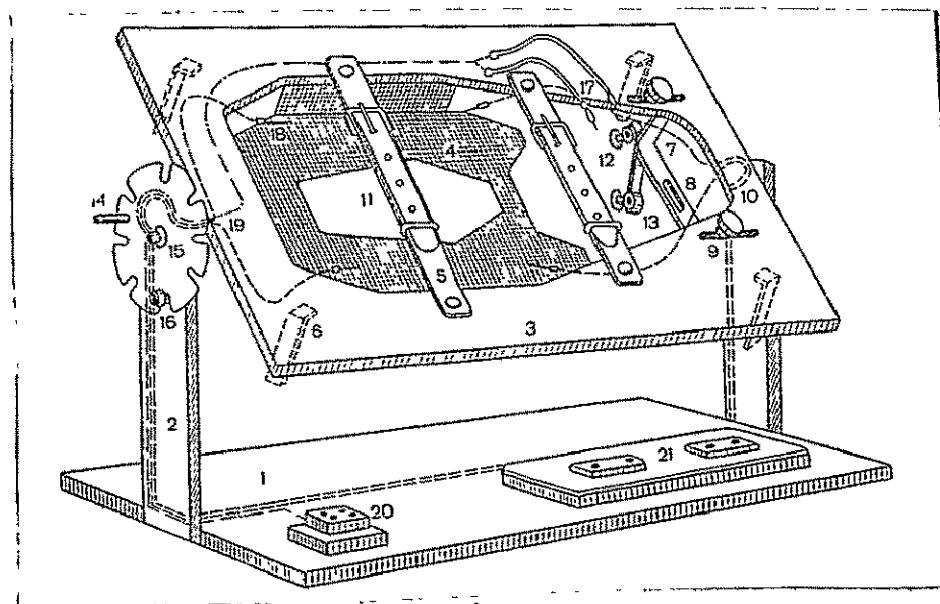


Figure 1. Sketch of Machine (in Position of Rotation of Rotating Plane by 45°). Explanations in Text.

The machine (figure 1, 2) is an original design of a table (30 x 18 x 16 cm) made of plastic with the use of metal parts. It consists of a support (1), two stands (2) and rotating plane (3) in whose special cavity (4) the experimental animal is placed on its stomach and is secured by straps (5). The four holders (6) arranged at the angles of the rotating plane of the machine guarantee immobilization of the extremities with the help of straps (figure 2). The device for securing the head is made of metal in the form

of a brace (7) with opening (8) for the upper blades.

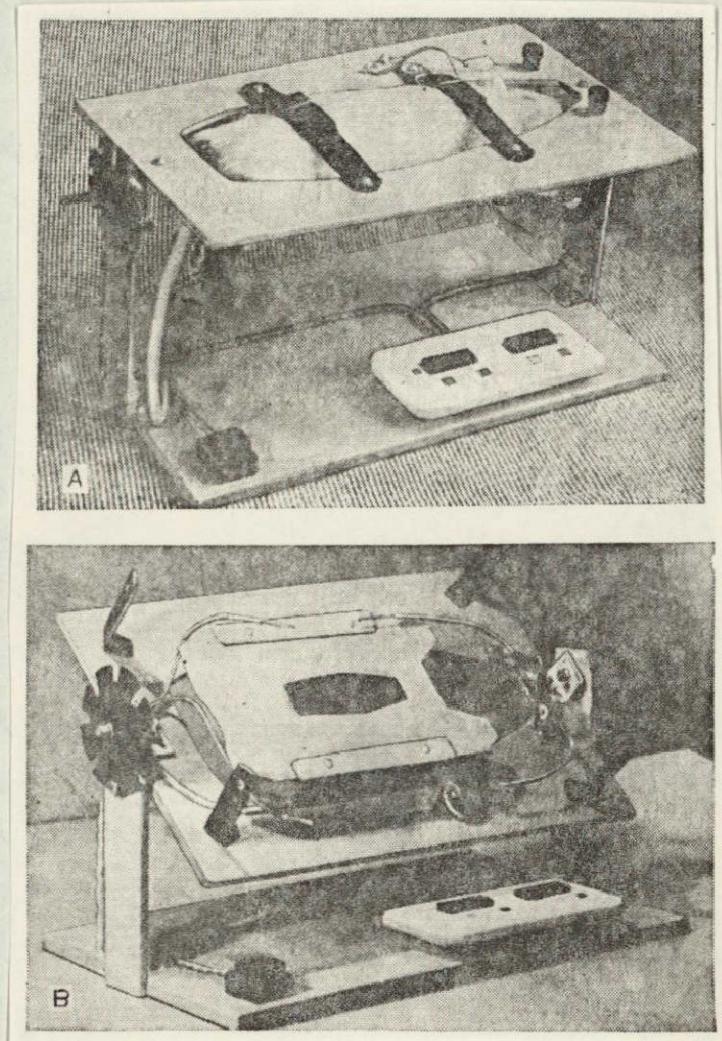


Figure 2. Overall View of Machine in Initial Position (A) and After Rotation of Rotating Plane by 225° (B).

Along the longitudinal slits (9) this brace is moved to the necessary position (depending on the dimensions of the animal) after which it is secured by screws (10) providing fixing of the head. In order to improve fixing the unit provides for additional head-holders. Access to the lower surface of the body, organs of the abdominal and thoracic cavities and the neck is

ORIGINAL PAGE IS
OF POOR QUALITY

implemented through opening (11), as well as through the free space between the anterior edges of the cavity (4) and the brace of the head-holder (7). During conducting of experiments linked to cannulation of the neck blood vessels and trachea cylindrical clamps are used for the vascular (12) and tracheal (13) cannula that guarantee the immobility of the latter in relation to the carotid artery (neck veins) and the trachea of the animal who is fixed in the machine during its rotations around the longitudinal axis. The rotation is implemented by handle (14) which is rigidly secured to the axis of rotation (15). The fixing of the rotating plane of the machine in the necessary position (every 45°) is attained with the help of latch (16). In order to feed impulses of a stimulating or coagulating current to the structures of the brain or the nerves of the animal spring contacts (17) are used, and to remove the biopotentials (EKG, EEG and so forth)--needle electrodes (18), that can be connected to the corresponding instrument by means of cable wires (19) through the input (20) and output (21) sockets. /82

The described machine can be used in experimental study of the activity of the nervous, endocrine cardiovascular, respiratory, digestive and other systems of the organism. As shown by the experience of numerous experiments it is convenient, simple to operate and significantly expands the possibilities of studies on small laboratory animals. With an increase in the dimension of the machine it can be used for work on larger animals..

REFERENCES

1. Arkhipov, G. N. Pat. fiziol. No 5 (1964), p 87.
2. Kogan, A. Kh., Ibid. No 6 (1959), p 69.
3. Larionov, L. N. Labor. delo, No 2 (1970), p 120.
4. Lemeshchenko, G. P., Ibid. No 6 (1968), p 375.
5. Samoylova, Z. T.; Khalyutina, L. V., Ibid. No 8 (1975), p 503.
6. Tyagin, N. V., Ibid. No 6 (1957), p 47.
7. Williams, J. K.; Harrison, T. K. and Grollman, A. J., J. Clin. Invest., vol 18, 1939, p 16.

Copyright Holder: Patologicheskaya fiziologiya i eksperimental'naya terapiya,
1979